Unit 1 1-Approximation

1) Approximate each of the following to the nearest hundredth:

a) 56.026 $\simeq$ ....

b) 2.6743 $\simeq$ ....

c) 564.296 $\simeq$ ....

d) 109.998 $\simeq$ ....

e) $45\frac{6}{1000}$ = ... $\simeq$ ....

f) 0.9953 $\simeq$ ....

g) $23\frac{3}{8}$ = ... $\simeq$ ....

h) $5\frac{6}{250}$ = ... $\simeq$ ....

i) $42\frac{7}{125}$ = ... $\simeq$ ....

j) 67.434 $\simeq$ ....

2) Approximate each of the following to the nearest thousandth:

a) 0.3642 $\simeq$ ....

b) 0.9986 $\simeq$ ....

c) 0.0003 $\simeq$ ....

d) $20\frac{78}{10000}$ = ... $\simeq$ ....

e) 0.0474 $\simeq$ ....

f) 19.9996 $\simeq$ ....

g) 21.3495 $\simeq$ ....

h) $\frac{86479}{10000}$ = ... $\simeq$ ....

3) Approximate each of the following:

a) 345 $\simeq$ .... to the nearest ten

b) 535 $\simeq$ .... to the nearest hundred

c) 8351 $\simeq$ .... to the nearest thousand

d) 543.21 $\simeq$ .... to the nearest unit

e) 3.321 $\simeq$ .... to the nearest tenth

f) 53.214 $\simeq$ .... to the nearest hundredth

g) 5.3178 $\simeq$ .... to the nearest hundredth

h) 3.4578 $\simeq$ .... to the nearest thousandth

i) 5.4543 $\simeq$ .... to the nearest $\frac{1}{1000}$

j) 3.7314 $\simeq$ .... to the nearest $\frac{1}{100}$

k) 5.375 $\simeq$ .... to the nearest 0.1

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4) Write: The greatest decimal fraction and the smallest one which consists of the digits 5 , 8 , 1 and 3 then approximate it to the nearest hundredth

The greatest = ... $\simeq$ ....

The smallest = ... $\simeq$ ....

5) Complete with suitable digits:

a) 4.6 ☐ 8 $\simeq$ 4.70 (to the nearest hundredth)

b) 70.28 ☐ 5 $\simeq$ 70.285 (to the nearest thousandth)

6) Complete:

a) The number 635.281 $\simeq$ 635.3 (to the nearest ....)

b) The number 143.23 $\simeq$ 140 (to the nearest ....)

c) The number 3659.284 $\simeq$ 3659.28 (to the nearest ....)

d) The number 143.23 $\simeq$ 143 (to the nearest ....)

7) Choose the correct answer:

a) .... $\simeq$ 34.26 (to the nearest hundredth)

(34.265 – 34.254 – 33.256 – 34.255)

b) 52.8695 $\simeq$ .... (to the nearest $\frac{1}{1000}$)

(52.87 – 52.8610 – 52.869 – 52.679)

c) .... $\simeq$ 45.5 (to the nearest 0.01)

(45.523 – 45.496 – 45.555 – 45.492)

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8) Find the result then approximate:

a) $2.345 + 31.504$ = ... $\simeq$ ....(to the nearest $\frac{1}{10}$)

b) $3.408 + 3.051$ = ... $\simeq$ ....(to the nearest $\frac{1}{100}$)

c) $0.3145 + 2.3143$= .... $\simeq$ ....(to the nearest $\frac{1}{1000}$)

d) $5.345 + 3.214$ = ... $\simeq$ ....

(to the nearest 2 decimal places)

e) $5.345 + 3.401$ = ... $\simeq$ ....

(to the nearest unit)

f) $2.253 + 12.564$ = ... $\simeq$ ....

(to the nearest $\frac{1}{100}$)

g) $251.76 + 38\frac{1}{8}$ = ... $\simeq$ ....

(to the nearest 0.01)

h) $17\frac{3}{4} + 71.0075$= .... $\simeq$ ....

(to the nearest 3 decimal places)

9) Complete:

a) 3.235 m $\simeq$ .... m

b) 250 hours $\simeq$ .... days

c) 58 days $\simeq$ .... weeks

d) 50 months $\simeq$ .... years

2-Comparing fractions

1) Put the suitable sign (<, > or =):

a) $\frac{7}{13}$ ☐ $\frac{5}{13}$

b) $\frac{3}{7}$ ☐ 1

c) $\frac{3}{5}$ ☐ $\frac{3}{8}$

d) $\frac{3}{5}$ ☐ $\frac{6}{10}$

e) $\frac{8}{25}$ ☐ $\frac{8}{18}$

f) $\frac{3}{8}$ ☐ 0.5

2) Arrange ascendingly:

a) $\frac{1}{2}$, $\frac{1}{3}$, $\frac{3}{4}$

The order: ……. , ……. , …….

b) $\frac{2}{9}$, $\frac{5}{6}$, 1 , $\frac{1}{3}$

The order: ……. , ……. , …….

3) Arrange descendingly:

a) $\frac{7}{9}$, $\frac{2}{3}$, $\frac{5}{6}$

The order: ……. , ……. , …….

b) $4\frac{7}{12}$, $4\frac{7}{18}$, $4\frac{7}{9}$

The order: ……. , ……. , …….

c) $\frac{1}{4}$, 0.2 , $\frac{1}{2}$, 0.6 , $\frac{3}{4}$

The order: ……. , ……. , ……. , ……. , …….

3-Multiplying decimal numbers by 10, 100 and 1000

1) Multiply:

a) $3.54 \times 10 =$ ....

b) $8.321 \times 100 =$ ....

c) $0.543 \times 1000 =$ ....

d) $36.5 \times 10 =$ ....

e) $4.02 \times 10 =$ ....

f) $8.306 \times 10 =$ ....

g) $0.46 \times 100 =$ ....

h) $0.000531 \times 1000 =$ ....

i) $532.014 \times 10 =$ ....

j) $3.0514 \times 100 =$ ....

k) $5.3 \times 100 =$ ....

l) $0.8 \times 1000 =$ ....

m) $3.46 \times 1000 =$ ....

n) $0.471 \times 1000 =$ ....

2) Put the suitable sign ($<$, $>$ or $=$):

a) 3.24×10 .... 32.4×100

b) 5.321×100 .... 53.21×10

c) 8.314×1000 .... 83.14×10

d) 0.73×1000 .... 7.3×10

e) 42.16×10 .... 0.04216×1000

f) 6.63×10 .... 0.663×100

3) Complete:

a) 1.5 km = ... m

b) 0.04 m^2 = ... dm^2

c) 0.8 dm^3 = ... cm^3

d) 0.1 cm = ... mm



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4-Multiplying a decimal numbers by an integer

1) Find the product:

a) 3.14×8 = ……….

b) 1.25×7 = ……….

c) 0.36×9 = ……….

d) 15.25×15 = ……….

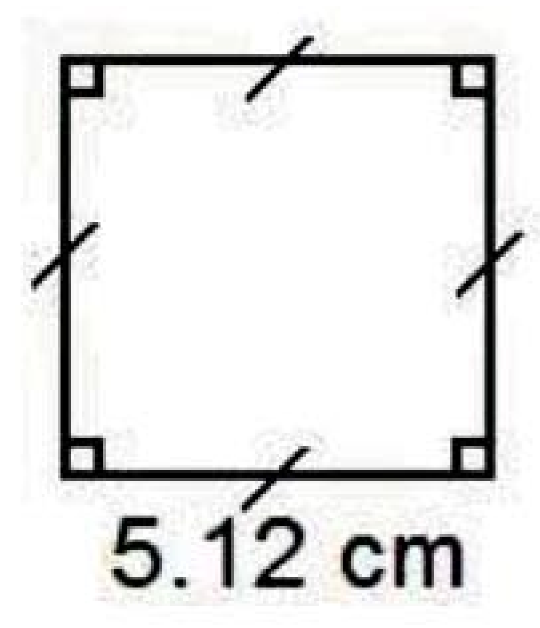
e) 98.35×12 = ……….

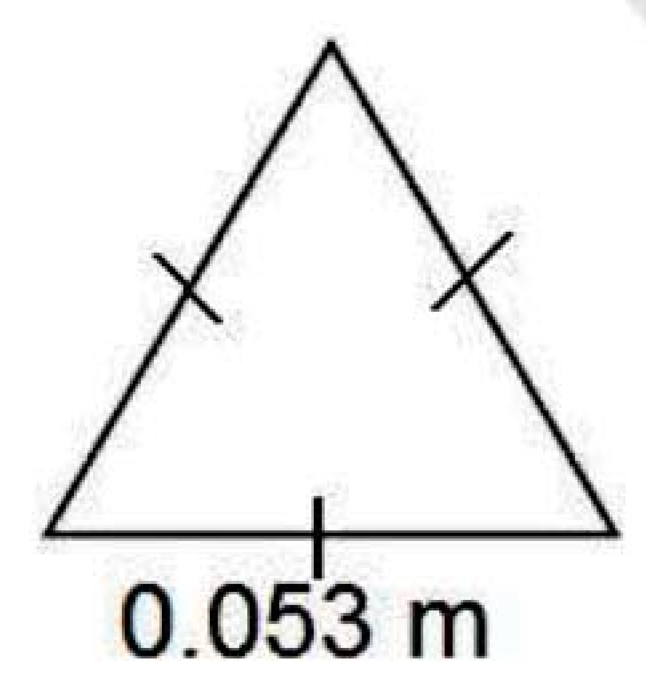
f) 0.07×5 = ……….

g) 37×0.002 = ……….

h) 7.2×75 = ……….

2) Find the perimeter of the following shapes:





P= ………………………………… P= …………………………………



5-Multiplying common fractions

Find the product:

a) $\frac{4}{9} \times \frac{5}{6} =$ ……….

b) $\frac{3}{8} \times \frac{16}{39} =$ ……….

c) $\frac{1}{6} \times \frac{2}{7} \times \frac{7}{9} =$ ……….

d) $\frac{5}{6} \times \frac{3}{4} \times \frac{4}{5} =$ ……….

e) $\frac{1}{6} \times 4 =$ ……….

f) $27 \times \frac{4}{7} =$ ……….

g) $1\frac{1}{3} \times 4 =$ ……….

h) $1\frac{1}{4} \times 3 =$ ……….

i) $5\frac{1}{4} \times 3\frac{1}{3} =$ ……….

j) $6\frac{3}{4} \times 2\frac{2}{9} =$ ……….

k) $3\frac{1}{2} \times 2\frac{4}{5} =$ ……….

l) $\frac{1}{3}$ of $\frac{1}{2} =$ ……….

m) $\frac{3}{5}$ of an hour = ………. min.

n) $\frac{3}{4}$ of a pound = ………. Pt.

o) $3\frac{9}{20}$ metres = ………. cm.

p) $2\frac{5}{6}$ day = ………. hours

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6-Multiplying decimal fractions

1) Find the product of each of the following:

a) 3.2 × 4.5 = ……….

b) 3.8 × 4.6 = ……….

c) 9.3 × 8.5 = ……….

d) 3.57 × 8.6 = ……….

e) 4.05 × 0.9 = ……….

f) 5.84 × 2.3 = ……….

2) Estimate the following product then compare your estimation to the actual result:

a) 3.1× 5.91 = …….. Estimated result …….. actual result ……..

b) 4.7×5.3 =…….. Estimated result …….. actual result ……..

c) 6.1×11.8 =…….. Estimated result …….. actual result ……..

3) Story problems:

a) The monthly salary of an employee is L.E 2562.75.

Find his salary in 7 months.

……………………………………………………………………………

b) If the price of one meter of cloth is L.E 23.5

Find the price of $4\frac{1}{2}$ meters of it.

……………………………………………………………………………



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c) Nader bought $3\frac{3}{4}$ kilograms of oranges for L.E 4 each and 2.5 kilograms of banana for L.E 3 each.

Find the money he paid.

……………………………………………………………………………

……………………………………………………………………………

……………………………………………………………………………

4) Find the product:

a) 3.14×8 = ……….

b) 37×0.002 = ……….

c) 1.25×0.7 = ……….

d) 7.2×7.5 = ……….

e) 0.36×9 = ……….

f) 12.84×2.6 = ……….

g) 15.25×0.01= ……….

h) 3.78×1.29 = ……….

i) 98.35×0.12 = ……….

j) 2.3×0.004 = ……….

k) 0.07×0.5 = ……….

l) 4.6×0.08 = ……….

7-Dividing Fractions

1) Complete :

a) The reciprocal of $\frac{1}{5}$ is ……….

b) The reciprocal of 2 is ……….

c) $\frac{3}{4}$ is The reciprocal of ……….

d) The reciprocal of $1\frac{1}{2}$ is ……….

2) Find the quotient:

a) $\frac{3}{5} \div \frac{1}{10} =$ ……….

b) $\frac{4}{3} \div \frac{2}{9} =$ ……….

c) $\frac{3}{2} \div \frac{3}{4} =$ ……….

d) $\frac{3}{4} \div 3 =$ ……….

e) $8\frac{1}{7} \div 7 =$ ……….

f) $4\frac{2}{3} \div \frac{1}{3} =$ ……….

g) $16 \div 2\frac{2}{5} =$ ……….

h) $\frac{9}{14} \div \frac{6}{35} =$ ……….

i) $4\frac{2}{3} \div \frac{7}{8} =$ ……….

j) $18 \div 2\frac{1}{4} =$ ……….



3) Complete:

a) $7\frac{1}{5} \div .... = 1\frac{1}{2}$

b) $....... \div 3\frac{1}{2} = 1$

c) $1\frac{3}{4} \div .... = \frac{5}{8}$

d) $...... \div 5\frac{1}{2} = \frac{7}{11}$

e) $\frac{5}{6} \times .... = \frac{2}{3}$

f) $\frac{3}{4} \times .... = \frac{7}{8}$

g) $..... \times \frac{3}{5} = 24$

h) $4\frac{1}{4} \times .... = 11$

i) $\frac{6}{5} \times .... = 4$

j) $\frac{3}{8} \times .... = 1$

k) $2\frac{1}{2} \times .... = 1$



8-Dividing decimals by 10, 100 and 1000:

1) Find the result of each of the following:

a) 42.5 ÷ 10 = ……….
b) 6.3 ÷ 10 = ……….
c) 5 ÷ 10 = ……….
d) 98.1 ÷ 100 = ……….
e) 7.45 ÷ 100 = ……….
f) 20 ÷ 100 = ……….
g) 8 ÷ 1000 = ……….
h) 4.1 ÷ 1000 = ……….
i) 0.4 ÷ 1000 = ……….
j) 27.6 ÷ 1000 = ……….
k) 70.5 ÷ 1000 = ……….
l) 100.1 ÷ 1000 = ……….

2) Complete:

a) 105 pt = …….. L.E
b) 200 cm = …….. m
c) 12.4 kg = …….. ton
d) 44.3 gm = …….. kg

3) Put the suitable sign (< , > or =):

a) 0.6 × 100 ………. 605.2 ÷ 100
b) 34.6 ÷ 100 ………. 0.0364 × 10
c) 1.78 ÷ 10 ………. 0.0178 × 100
d) 200 pt ………. 1.5 L.E

4) Complete:

a) ………. ÷ 10 = 4.225
b) ………. × 100 = 6.3
c) 0.5 × ………. = 50
d) 1 ÷ ………. = 0.001

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(9-10) Finite and Infinite division:

1) Find the quotient of each of the following:

a) 180 ÷ 5 = ...

b) 5112 ÷ 9 = ...

c) 7740 ÷ 36 = ...

d) 6848 ÷ 214 = ...

e) 13975 ÷ 215 = ...

f) 21125 ÷ 325 = ...

g) 30672 ÷ 852 = ...

h) 36844 ÷ 152 = ... ≃ .... (to the nearest hundredth)

i) 24 ÷ 108 = ...

≃ .... (to the nearest 1 decimal place)

j) 285 ÷ 7 = ...

≃ .... (to the nearest 2 decimal places)

k) 7 ÷ 9 = ...

≃ .... (to the nearest tenth)

l) 172.8 ÷ 2.16 = ...

m) 36.18 ÷ 0.09 = ...

n) 1.32 ÷ 1.1 = ...



2) The area of a rectangle is 25.65 cm^2, and its length is 6.2 cm. find its width then approximate the result to the nearest hundredth of centimeter.

…………………………………………………………………………

…………………………………………………………………………

3) The area of a rectangle is 28.6 cm^2, and its width is 4.4 cm. find its length and perimeter.

…………………………………………………………………………

…………………………………………………………………………

4) The side length of a square is 3.05 m. find its area approximating it to the nearest hundredth.

…………………………………………………………………………

…………………………………………………………………………

5) The perimeter of a square is $\frac{4}{5}$ m, Find the length of its side and its area.

…………………………………………………………………………

…………………………………………………………………………

6) Find the area of the rectangle if its dimensions are 3.5 cm , 6.5 cm then approximate the result to the nearest tenth

…………………………………………………………………………



Unit 2: Sets

1-What is a set?

The set: is a collection of well-defined objects and they have a certain property in common.

1) State which of the following is a set and which is not a set:

a) The digits of the number 5321.
b) Tall men in Egypt.
c) The beautiful girls in your school.
d) The factors of number 8.
e) Seasons of the year.
f) Clever people living in your country.
g) Prime numbers between 5 and 30.
h) Rainbow colours.

Elements of the sets:

Example:
Write the elements of the set of digits of the number 314.
Solution: The elements are 3, 1 and 4.

2) Write two elements only of each of the following sets:

a) The months of the Christian year.

b) The set of even numbers.

c) Geometric figures.

d) The whole numbers between 4 and 10.

e) The factors of 10.

f) The set of odd numbers.

2- Mathematical expression of a Set

Express a set by listing method and description (words) method.

1) Express each of the following sets by listing method:

a) A= The set of digits in the number 5432. A=………………

b) B= The set of letters in the word "Arabic". B=………………

c) C= The set of days in the week. ……………………

d) D= The set of first 7 prim numbers. ……………………

e) E = The set of digits of the number 8350. ……………………

f) F= The set of multiples of 3 between 3 and 18. ……………………

2) Express each of the following sets by in words:

a) A= { White , Red , Black} …………………………

b) B= { 1 , 2 , 3 , 4} …………………………

c) C= { Summer , Winter , Autumn , Spring } …………………………

3) List the elements of each of the following sets:

a) { a<5 where a is a whole number } A={ }

b) {6+ x<10 where x is a whole number } X={ }

c) { 5+y<11 where y is a whole number } Y={ }



Representing sets by Venn diagram

1) Represent each of the following sets by Venn diagram:

a) X= { 5,7,8 }

b) Y = The set of whole numbers smaller than7

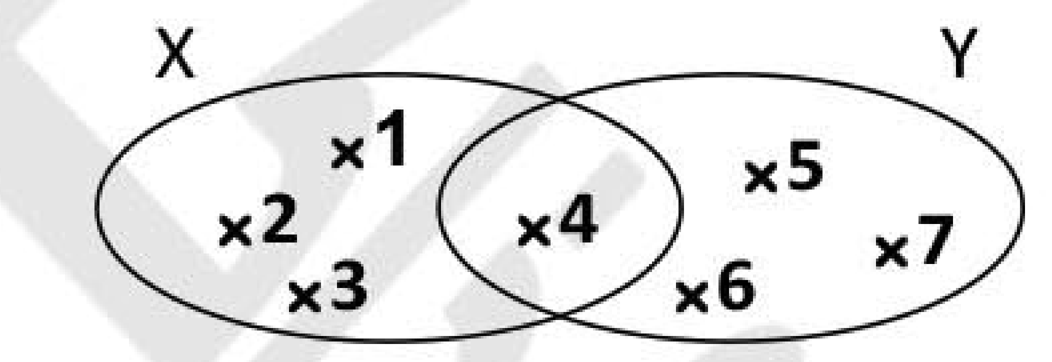
c) Z = The set of letters in the word "Happy"

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2) List the elements of each of the following:

X= { }

Y= { }



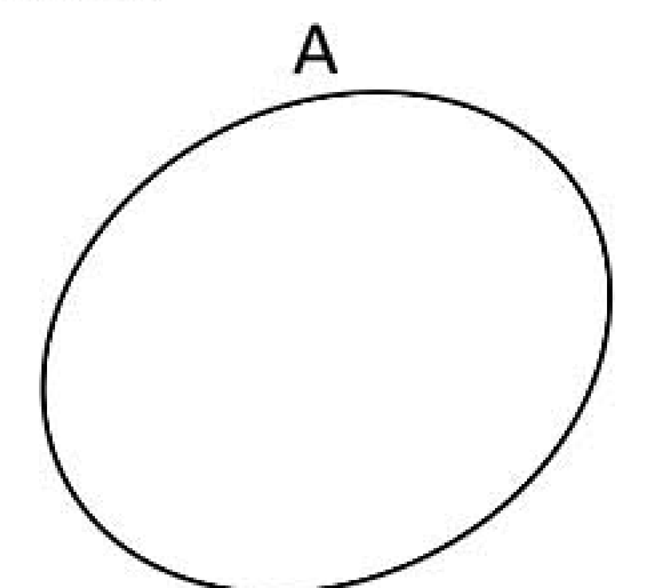
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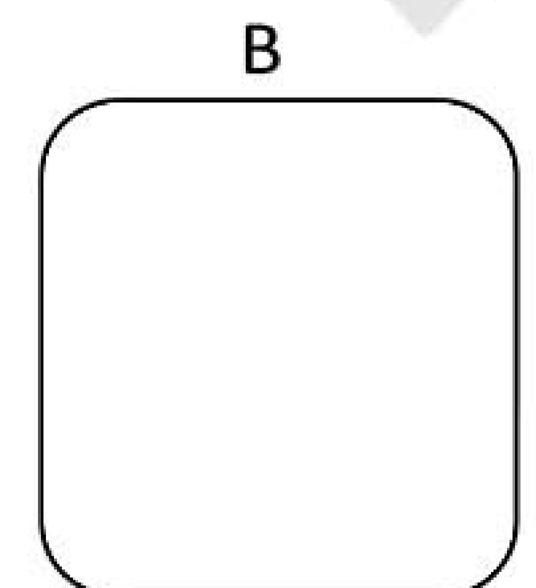
3) Complete the opposite figure to be a Venn diagram for the two sets A and B:

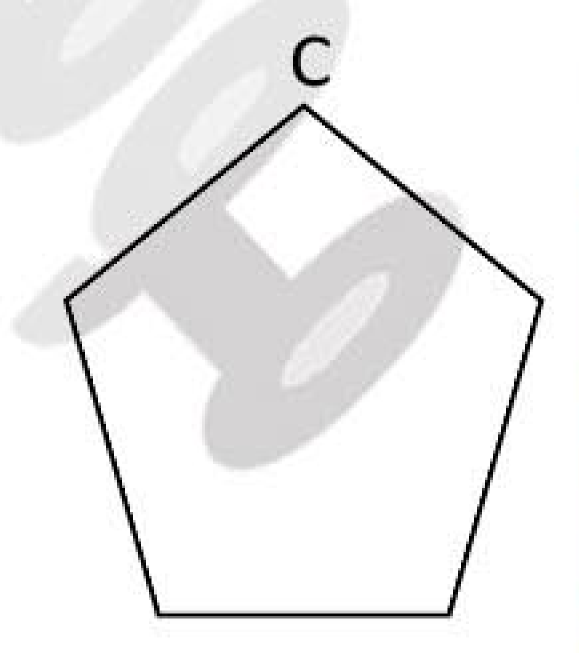
A= { 5,6,7,8 }

B= { 3,2,4,1}

C= { a , b , c , d}







3- Belonging of an element to a Set

The symbol ∈ : means (is an element of) or (Belongs to)
The symbol ∉ : means (is not an element of) or (doesn't Belong to)

1) Put the suitable sign ∈ or ∉ :

a) 3 ...... { 1, 3, 5}
b) 5 ...... {2, 0}
c) 21...... {1, 2, 21}
d) 15 ...... {1, 5}
e) 7 ...... the set of odd numbers.
f) 9 ...... the set of prime numbers.
g) April ...... the set of the days of the week.

2) Complete using a suitable number:

a) If 3 ∈ {1 , x , 5 } then x=.........
b) If 4 ∈ {2 , S+2 , 6 } then S=.........
c) If 6 ∈ {Y-4, 12 } then Y=.........
d) ...... ∈ {1, 2 , 3 } and belongs also to the set of even numbers
e) ...... ∈ {2, 3 , 5 } and belongs also to the set of the factors of the number 9.

3) If P= all the prime numbers, which of the following statement are true:

a) 8 ∈ P (.....)
b) 51 ∈ P (.....)
c) 50 ∈ P (.....)
d) 4 ∈ P (.....)
e) 80 ∈ P (.....)
f) 17 ∈ P (.....)



4-Types of sets

1) The null set (empty set) : is a set that has no element and denoted by { } or ∅ which is read "Fai"

2) The finite set : is a set that has a countable (limited) number of elements.

3) The infinite set: contains an uncountable (unlimited) number of elements.

1) State which of the following is "empty" or "not empty":

a) The set of pupils in your school.

b) The set of Arabic countries in USA.

c) The set of even numbers between 5 and 15.

d) The set of odd numbers between 9 and 11

e) The set of triangles having 4 sides.

f) The set of odd numbers which are divisible by 2.

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2) State which of the following is "finite" or "infinite":

a) The set of rivers in your country.

b) The set of whole numbers greater than 5.

c) The set of prime numbers.

d) The set of multiples of the number 2.

e) The set of whole numbers smaller than 5.

f) The set of Arabic countries.

5- Equal sets

Equal sets: The sets which contain the same elements exactly.

1) Complete by using the suitable symbol of = or ≠:

a) { 5 } …….. { 5 , 1 }

b) { 51 } …….. { 51 }

c) { 8 , 3 , 7} …….. { 7 , 8 , 3}

d) { A , B , C } …….. { C , A , B}

e) { Ahmed } …….. { A , h , m , e , d }

2) Mark (✓) or (×):

a) { 3, 5 , 7 } = The set of the odd numbers between 1 and 9 (….)

b) { 0 , 1 , 5 } = The set of the digits of the number 110512 (….)

c) The set of letters in the word "line" and the set of letters in the word " Nile" (….)

d) The set of digits in the number 345 and the set of digits in the number 43534 (….)

3) Find the value of x and y in each of the following:

a) { 3 , 7 } = { 7 , x }



b) { 5 , 3 , 2 } = { 3 , y , 2 }

c) { 8 , 5 , 9 } = { x+2 , 5 , 8 }

6- Inclusion and Subsets

The symbol ⊂ : means (is a subset of) or (is included in)

The symbol ⊄ : means (is not a subset of) or (is not included in)

∈ , ∉ (relation between an element and a set)

⊂, ⊄ (relation between two sets)

1) Put the suitable sign ∈, ∉, ⊂ or ⊄ :

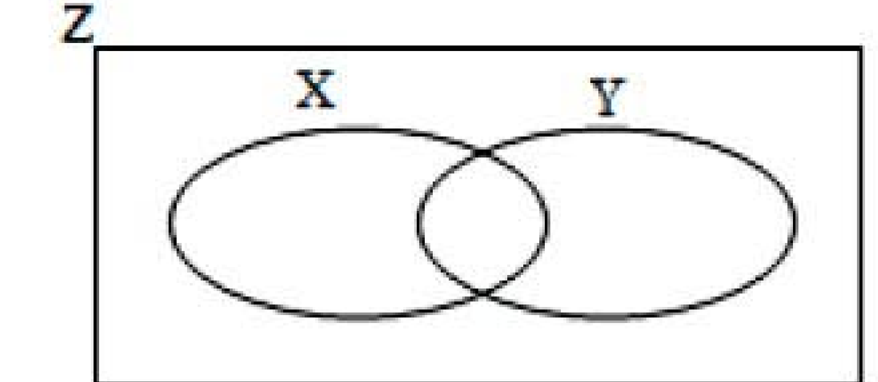
a) 7 …….. { 5 , 7, 3 }
b) 15 …….. { 15, 13, 10 }
c) { 1 , 2 } …….. { 1 , 3 , 5 , 2}
d) { 2 , 1 , 3 } …….. { 1 , 2 , 3, 5}
e) Ø …….. { 0 , 2 , 3 }
f) {3, 2} …….. { 32, 53}
g) { 9 } …….. {3, 9, 6}
h) { 5, 2, 0 } …….. {5, 1, 3, 2, 0}
i) { 5 } …….. The set of odd numbers.
j) { 1, 2, 7 } …….. The set of Prime numbers.

2) Write all subsets of the following sets :

a) A= {4} ……………………………………………………………………
b) B= {1 , 3, 5} ……………………………………………………………………
c) X = {6 , 8} ……………………………………………………………………

3) Mark (✓) or (×):

a) X ⊂ Z (….) e) Z ⊂ Y (….)
b) X ⊄ Y (….) f) Z ⊄ X (….)

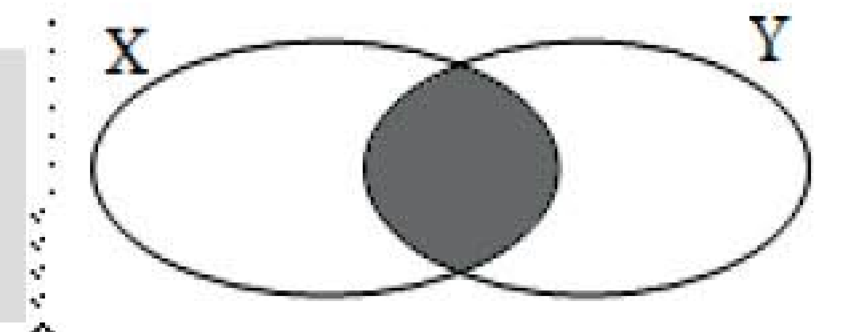


c) $Y \not\subset Z$ (....)   g) $\emptyset \subset X$ (....)

d) $Z \subset Z$ (....)   h) $Z \subset \emptyset$ (....)

Operations on sets

7- Intersection of two sets



The intersection " ∩ ":

$X \cap Y$ = The set of all common elements in the sets X and Y .

1) Find each of the following:

a) { 3, 5, 7 } ∩ { 3, 6, 9 } = ...

b) { 3, 10, 9, 5 } ∩ { 5, 9, 8, 11 }= ....

c) { 7, 3, 2, 5 } ∩ { 3} = ...

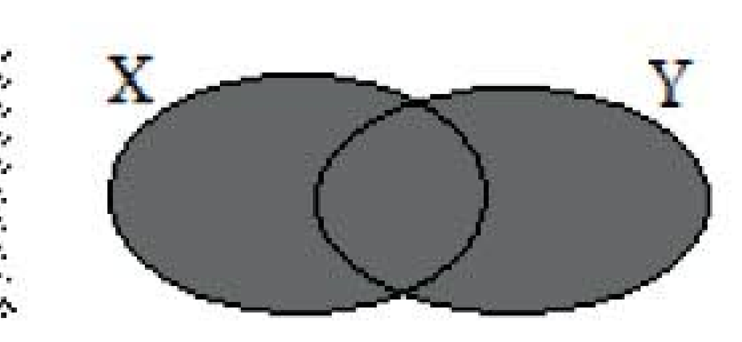
d) { 3, 2, 5, 9, 10 } ∩ { 1, 4, 6, 7 } = ...

e) Ø ∩ { 1, 4, 6, 7 } = ...

Properties of intersection:

- $X \cap Y = Y \cap X$ **(Commutative Property)**
- $X \cap \emptyset = \emptyset \cap X = \emptyset$
- $(X \cap Y) \cap Z = Y \cap (X \cap Z)$ **(Associative Property)**
- **If** $X \subset Y$ **then** $X \cap Y = X$
- **If** $X = Y$ **then** $X \cap Y = X = Y$

8- Union of two sets



The union " ∪ ":

$X \cup Y$ = The set of all elements which belong to X or Y



2) Find each of the following:

a) { 3, 5, 7 } ∪ { 3, 6, 9 } = ...

b) { 2, 5, 8 } ∪ { 1, 2, 9, 6 } = ...

c) { 5, 1, 8, 9 } ∪ { 2, 1, 3, 0, 15 }= ....

d) { 53, 21 } ∪ { 2, 3, 5, 1 } = ...

f) { 1, 3, 0 } ∪ ∅ = ...

3) If X= {1, 2, 3 }, Y= { 2, 0, 4} find :

a) X ∪ Y = ...

b) X ∩ Y = ...

Properties of union:

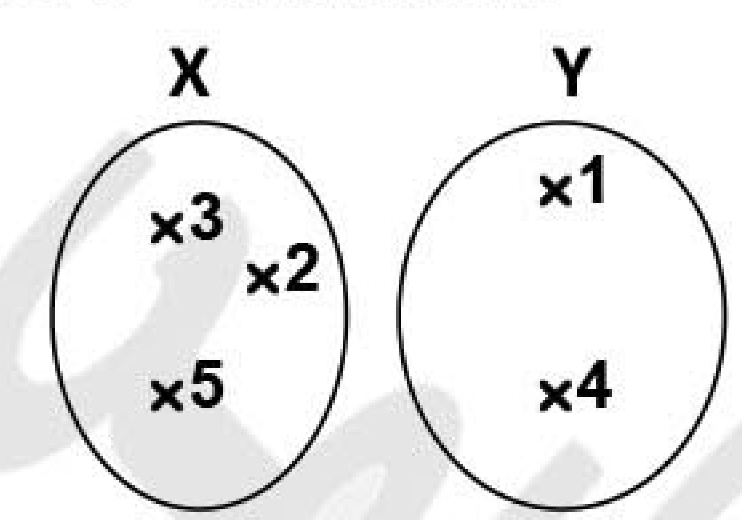
- X ∪ Y = Y ∪ X (Commutative Property)
- X ∪ ∅ = ∅ ∪ X = X
- (X ∪ Y) ∪ Z= Y ∪ (X ∪ Z) (Associative Property)
- If X ⊂ Y then X ∪ Y = Y
- If X = Y then X ∪ Y = X = Y

4) Complete:



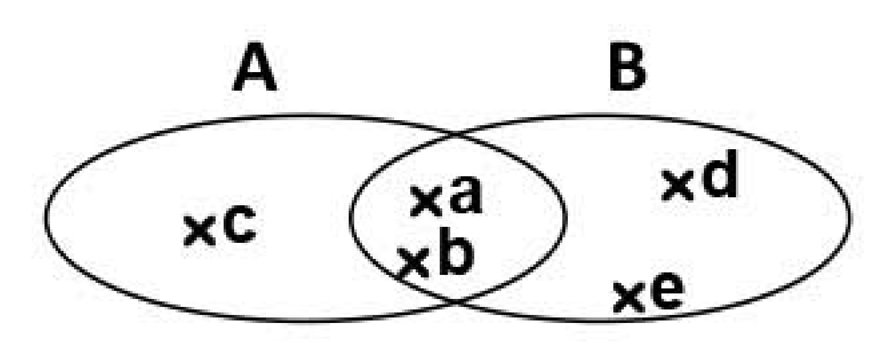
a) X ∩ Y= ....

X ∪ Y= ....



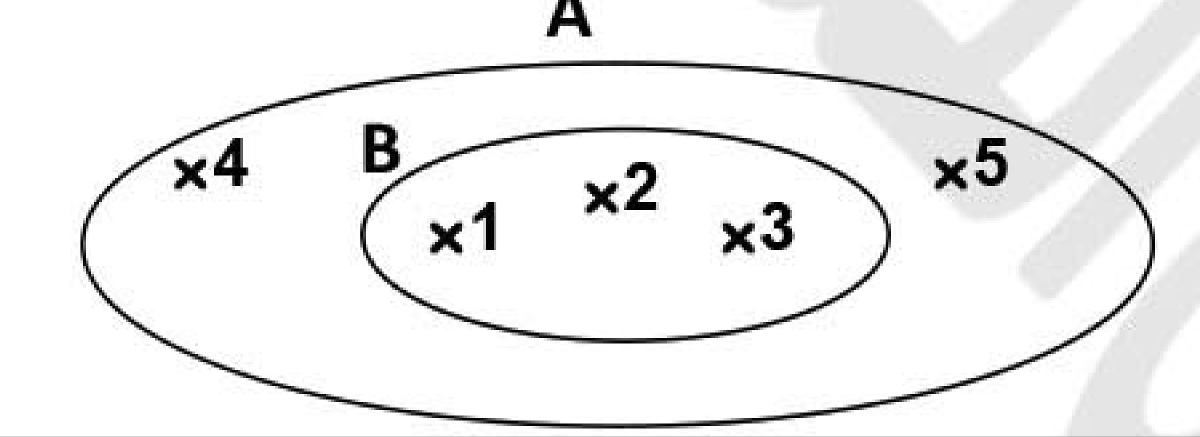
b) A ∩ B= ....

A ∪ B= ....



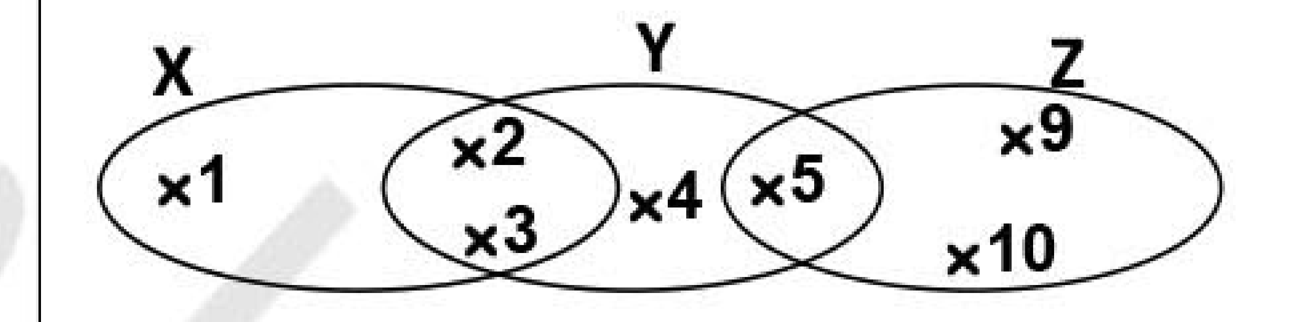
c) A ∩ B= ....

A ∪ B= ....



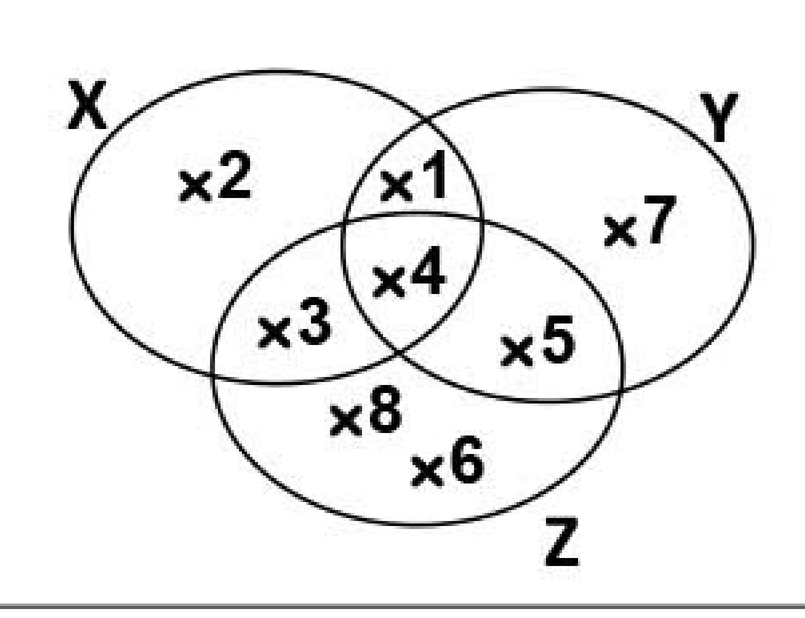
d) X ∩ Y ∩ Z= ....

X ∪ Y ∪ Z= ....



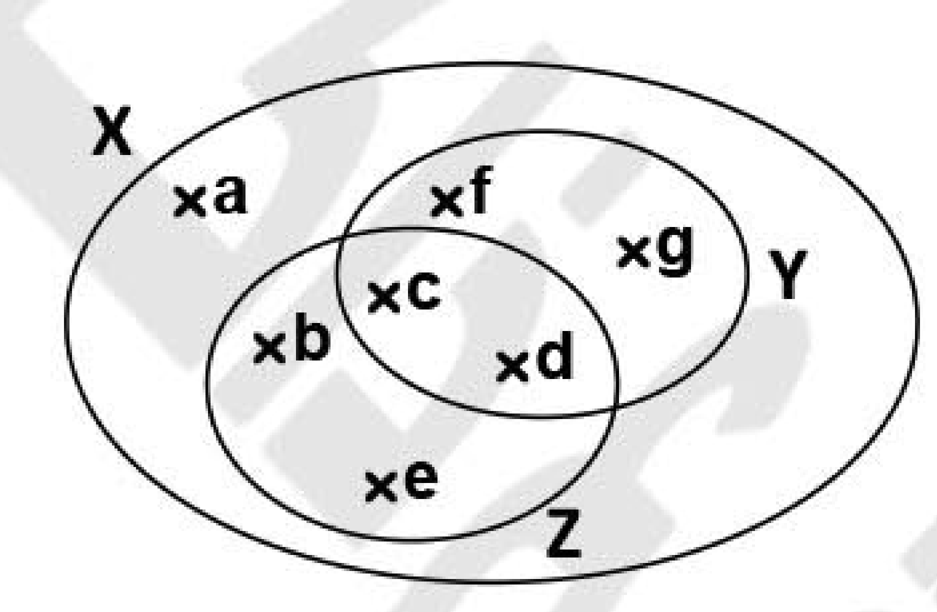
e) X ∩ Y ∩ Z= ....

X ∪ Y ∪ Z= ....



f) X ∩ Y ∩ Z= ....

X ∪ Y ∪ Z= ....



5) Complete using sign ∈, ∉, ⊂ or ⊄ :

a) If A= { 1, 3, 5, 7} ∩ { 2, 3, 5}   then 3 ...... A

b) If B= { 2, 5, 6} ∪ { 5}   then {5,6} ...... B

c) If Z= { 5, 10, 15} ∩ { 1, 2, 3}   then {5, 10} ...... Z

d) If X= { c, f, g} ∪ { a, b, c, d}   then e X

9- The universal set "U"

The *universal set "U"*:
It is the mother set which includes all the given subsets.

1) Write a suitable universal set for the following subsets:

a) A= { April , May, June }
B= {January, April, September}
U= ....

b) X= { 2 , 4 , 6 }
Y= { 6 , 8 , 10 , 12}
U= ....

c) C= { Asia , Africa , Australia }
U= ....

d) X= { Sunday , Monday }
Y= {Friday , Sunday }
U= ....

e) E= { Winter , Autumn }
F= {Summer }
U= ....

f) Y= { 1, 2, 3 }
Z= {2, 6 }
U= ....

10- The complement of a set

The complement of the set A:

A\` (All elements in the universal set U that are not in A)

U

A\` A

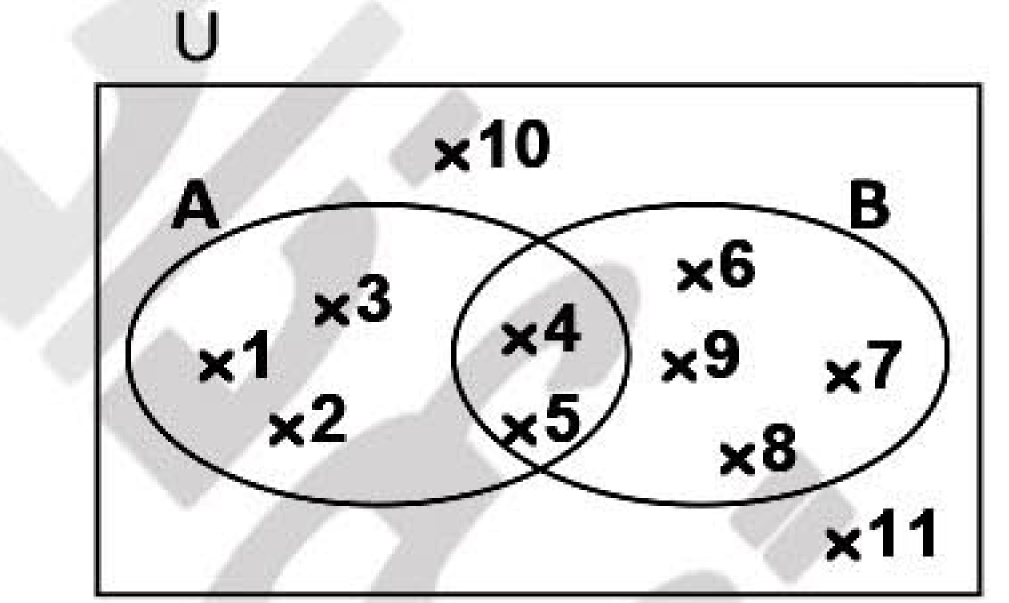
Notes:

- **(A\`)\`= A**
- **A ∪ A\`= U**
- **A ∩ A\`= Ø**

Ex.: If U= { 1, 5, 7, 8, 10, 12, 15 } and A= { 1, 5, 7 }

Then A\`= { 8, 10, 12, 15 }

1) From the figure opposite if U is the universal set complete:



A\`= ....

B\`= ....

A\`∪ B\`= ....

A ∩ B = ...

(A ∩ B)\` = ...

2) Complete:

a) (A\`)\`= ....

b) If U = {1, 2, 3, 4, 5, 6}, X= {1, 2, 3} then X\`= ....

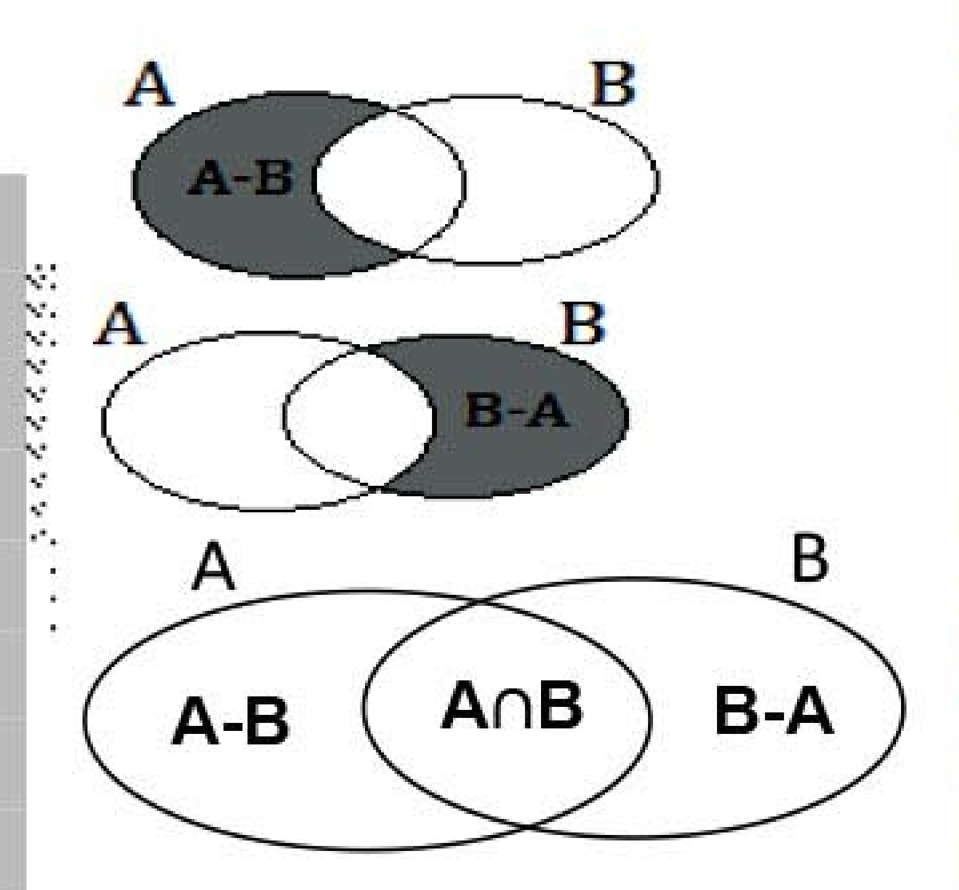
c) X ∩ X\`= ....

d) X ∪ X\`= ....



11- The difference of two sets

The difference:



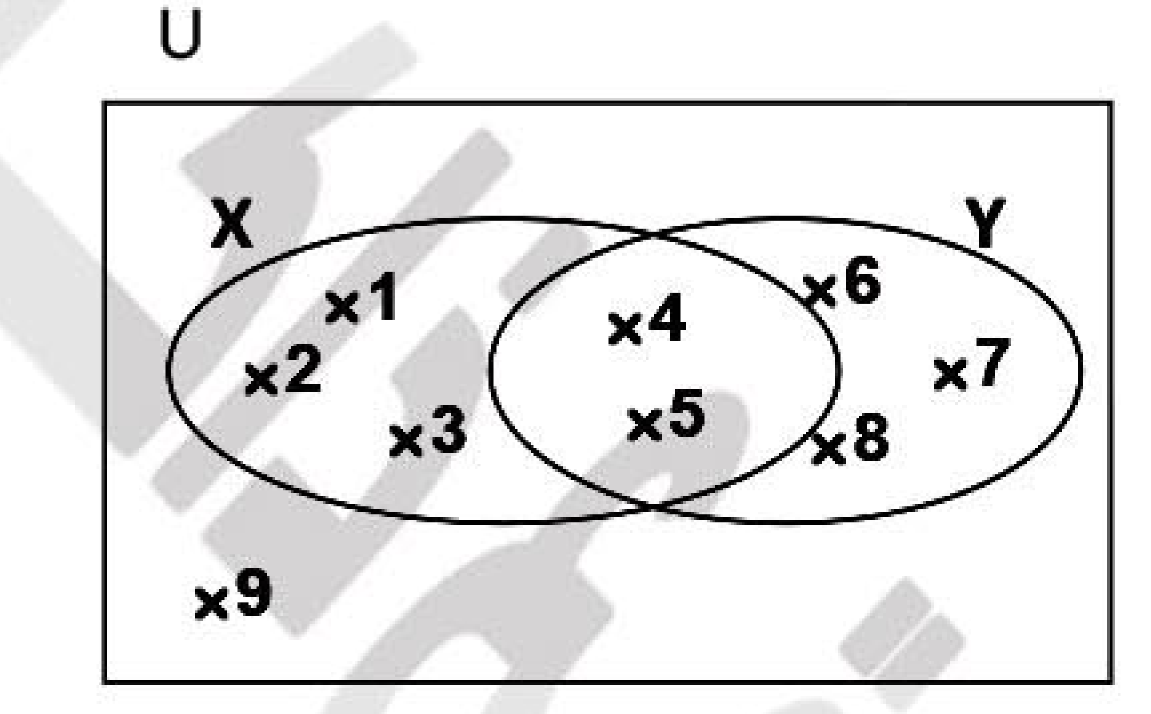
- A-B (All elements in A but not in B)
- B-A (All elements in B but not in A)

Notes:

- A-B ≠ B-A
- A-A= Ø
- A- Ø =A
- Ø -A= Ø
- U- A =A`

Ex.: If A= { 3, 4, 5, 6, 7 } and B= { 3, 5, 2, 8 }
Then A-B = { 4, 6, 7 }
B-A= { 2, 8 }

1) Complete using the opposite Venn diagram:



a) X = ...
b) Y= ....
c) X ∪ Y = ...
d) X ∩ Y = ...
e) X - Y = ...
f) Y - X = ...
g) Y` = ...
h) X` = ...

2) Complete:

a) If X-Y= {1}, Y-X= {3} and X∩Y={2,4} then X∪Y={...............................}

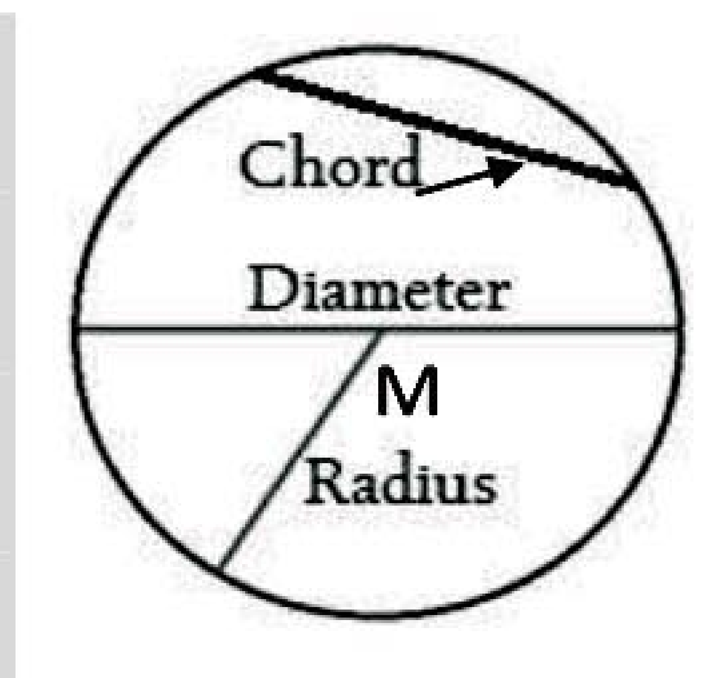
b) X-X= ....

c) U-X= ....

d) X- Ø= ....



Unit 3: The circle



The circle: is a closed curve, all the points on it having the same distance from the centre.

(It is drawn by the compasses and named by its centre)

The radius "r": is the line segment that joins any point on the circle and the centre of the circle.

The chord: is the line segment that joins any two points on the circle.

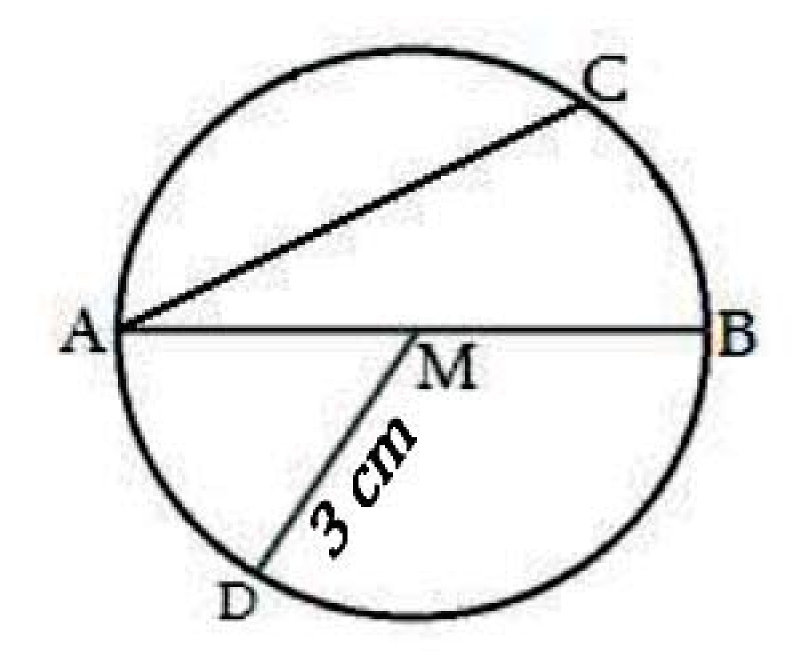
The diameter "d": is the line segment that passes through the centre of the circle and joining two points on the circle.

Notes:

- The diameter = twice the radius $d = 2 \times r = 2r$
- The radius = half the diameter $r = d \div 2$
- The diameter is a chord passing through the centre of the circle.
- The diameter is the longest chord in the circle.
- The circle has infinite number of diameters.
- All the radii of a circle are equal in length.
- All the diameters of a circle are equal in length.



1) **In the opposite figure:**



a) $\overline{AB}$ is a .... of the circle

b) $\overline{AC}$ is a .... of the circle

c) M is a .... of the circle

d) $\overline{MD}$ is a .... of the circle

e) AB = ... cm

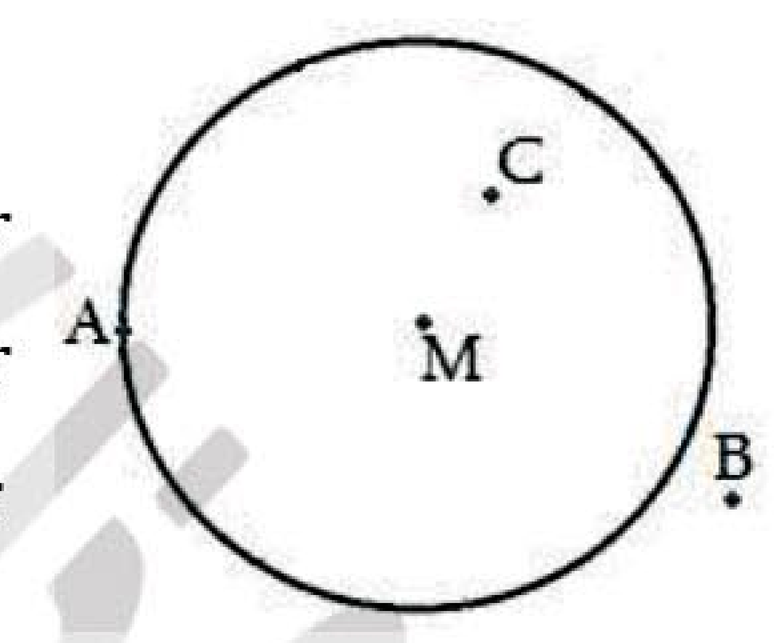
f) MD = $\frac{1}{2}$ ....

g) The longest chord in the circle is ....

2) **In the opposite figure:**

There is a circle M of a radius r

Complete using "on, inside or outside", "> , < or =":

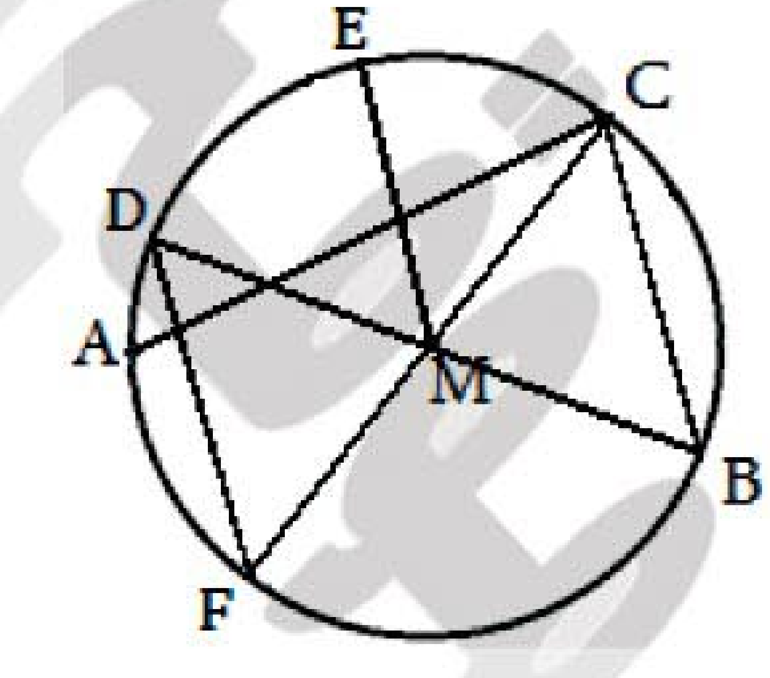


a) Point A is located .... the circle M and MA .... r

b) Point B is located .... the circle M and MB .... r

c) Point C is located .... the circle M and MC .... r

3) **In the opposite figure:**



a) The radii of the circle are ...., ..., ..., ..., ...

b) The diameters of the circle are ...., ...

c) The chords of the circle are ...., ..., ..., ..., ...

4) **Draw:**

a) A circle M with radius 3 cm.

b) A circle X with diameter 8 cm.

c) A circle A with radius 4.5 cm.

d) A line segment with the length 5 cm, Use it as a radius to construct a circle.

e) The circle of centre M with radius 5 cm, Draw the diameter $\overline{AB}$ then draw the chord $\overline{BC}$ with length 6 cm, then draw $\overline{AC}$, What is the type of the triangle ABC according to the measure of its angles?

5) ***Complete:***

a) All radii of the circle are ……….

b) Any chord passes through the centre of the circle is called ………

c) The length of the radius in the circle= ……… the length of its diameter.

d) If the length of the radius of a circle is 4 cm then the length of the longest chord is ……… cm.

e) If M is a circle whose radius is 4 cm where MA= 3 cm then the point A is located …………….. the circle.

f) If M is a circle whose diameter is 4 cm where MX= 3 cm then the point X is located …………….. the circle

g) If M is a circle whose radius is 5 cm where MB= 5 cm then the point B is located …………….. the circle.

h) The midpoint of any diameter is ……………………

2-Drawing a triangle given the lengths of its three sides

1) Draw the triangle ABC with AB= 5 cm, BC= 4 cm and CA= 3 cm

2) Draw the triangle XYZ in which XY= 8 cm, YZ= 5 cm and XZ= 6cm, Find the type of this triangle according to the measure of its angles.

3) Draw the triangle ABC in which m(∠A)=50°, m(∠B)=70° and AB=6 cm

4) Draw a circle whose diameter is 8 cm long and its centre is A, $\overline{XY}$ is a diameter of this circle. Draw the triangle XYZ where XY=YZ=ZC=8cm.

3- Drawing the altitudes of the triangle

1) Draw the triangle ABC in which AB=4cm, BC=5cm and CA=3cm.
   Draw the altitudes of this triangle then measure their length.

2) Draw Δ ABC in which AB=8cm, BC=9cm and CA=5.5cm, Draw the altitudes of this triangle then measure their length.

3) Draw the line segment $\overline{BC}$, where BC=6cm, D is the midpoint of $\overline{BC}$, Draw $\overline{DA}$ perpendicular to $\overline{BC}$ where DA=7 cm, Measure the length of each of $\overline{AB}$ and $\overline{AC}$.

4) Draw ΔXYZ in which XZ=ZY=XY=6cm, Draw the altitudes of this Δ then measure the length of altitudes of the triangle.

5) *Complete:*

a) In the acute triangle the three altitudes intersect at one point …………….. the triangle.

b) Any triangle has …………… altitudes.

c) The altitudes of the …………… –angled triangle intersect at one point outside the triangle.

d) The altitudes of the right –angled triangle intersect at the vertex of the …………… angle.

Unit 4: *Probability*

1) Complete:

a) The probability of the impossible event is ……………………

b) The probability of the certain event is ……………………

c) A basket contains cards numbered from 1 to 20. If a card was drawn randomly, then the probability that the number written on the card is divisible by 5 is ……………………

d) The probability of choosing the letter "d" from the letters of the word "Duck" is ……………………

e) The probability of an event is always ……… or ……… or a number between ……… and ………

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2) A bag contains 5 white balls, 7 black balls and 3 red balls. All of which are of equal size. When a ball is drawn randomly from the box,

Find the probability of:

a) Black ball b) Yellow ball c) White ball or red ball

---

3) A box contains 20 cards numbered from 1 to 20. A card is drawn randomly

Calculate the probability of:

a) The drawn card carries a prime number between 4 and 15.

b) The drawn card carries a number divisible by 7.

---

4) A fair die was thrown once, the probability of appearing:

- An odd number greater than 2
- A number greater than 6.
- An even prime number.
- A number divisible by 2.



Test 1

1) Choose the correct answer:

a) $3.75 \times 1000 =$ ……….. (375 - 0.375 - 3.75 - 3750)

b) { 4} ……….. { 3, 5 , 7} ($\in$ - $\notin$ - $\subset$ - $\not\subset$)

c) The length of the radius in the circle= ……… the length of its diameter

($\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{5}$, $\frac{1}{2}$)

d) Any triangle has …………… altitudes. (1, 2 , 3, 4)

e) The number 325.271 $\simeq$ 325.3 to the nearest ……………

(tens - tenth - hundredth - hundred)

f) $6.76 \div 0.26 = 676 \div$ ………… (2.6 - 0.26 - 26 - 260)

g) Any line segment which joins two points on the circle is called a ………… (chord , radius, diameter)

2) Complete:

a) The probability of the certain event is ……………………

b) Prime numbers $\cap$ {6, 7, 8, 9, 10, 11} = ……………………………………

c) If {1,3} $\cap$ {x+1 , 4} = {3}, then x=……………………

d) $1.27 \times 2.5 = 12.7 \times$ …………

e) The longest chord in a circle is called ……………….

3) a) Draw a circle M whose diameter is 5 cm, then draw its diameter $\overline{AB}$, then draw the chord $\overline{BC}$ with length 3 cm, then draw $\overline{AC}$ and draw $\overline{CD} \perp \overline{AB}$, find the length of $\overline{AC}$, $\overline{CD}$.

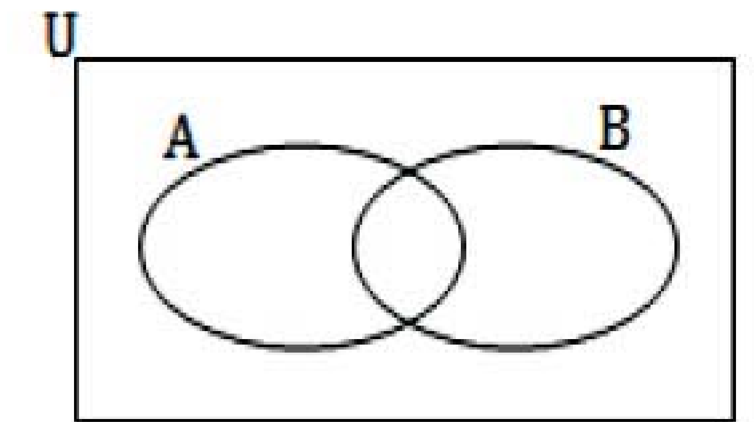
b) Find the area of the rectangle of 10.5 cm length and 6.2 cm width.

4) a) Arrange in a descending order: $2\frac{1}{2}$, $2\frac{5}{8}$, $2\frac{3}{4}$ *and* $2\frac{5}{16}$

b) The product of two numbers is 598 if one of them is 23 then what is the other number?

5) a) Represent each of the following sets by Venn diagram:

U = {1, 2, 3, 4, 5, 6, 7}, A= {2, 4, 7,}, B={ 1, 3, 7}



Then Use the Venn diagram to list the following sets:

1) A ∩ B 2) A ∪ B 3) A` , B` 4) A-B

b) A box contains 30 cards numbered from 1 to 30 if a card is drawn randomly calculate the probability that the drawn card carries :

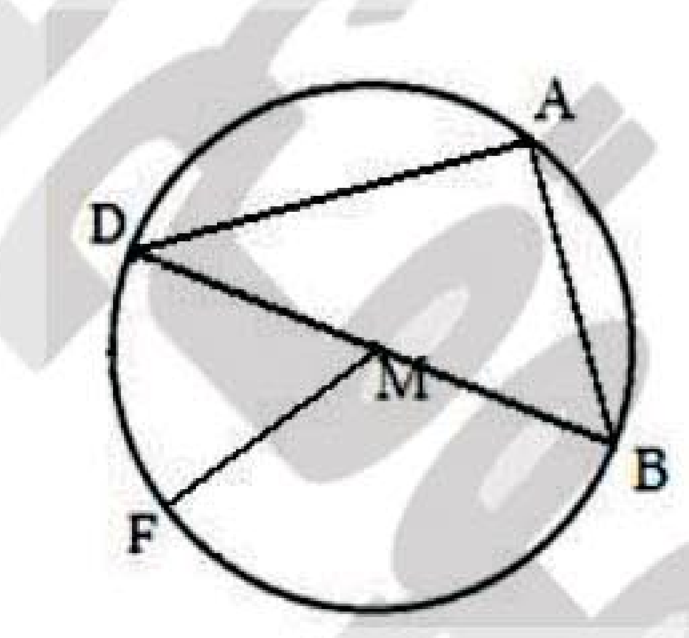
- An even number.
- An even prime number.
- A number divisible by 6.
- A number less than 9.
- A number divisible by 3 or 5.

6) **a)In the opposite figure:**

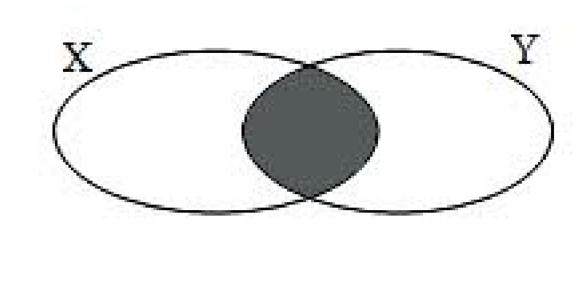
a) The radii of the circle are ...., ..., ...

b) The longest chord in the circle is ....

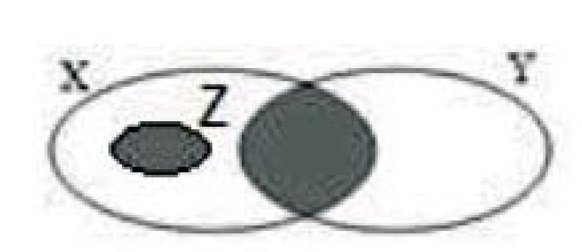
c) The chords of the circle are ...., ..., ...



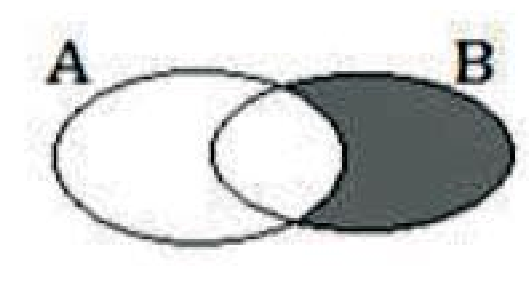
b) Write what is represented by shaded part in each diagram:



....



....



....

Test 2

1) Choose the correct answer:

a) The probability of the impossible event is ………… ($\frac{1}{4}$, 0 , 1 , $\frac{1}{2}$)

b) If the length of the radius of a circle is 2 cm then the length of the longest chord is ……… cm (6, 2 , 3, 4)

c) $663.9 \div 1000 =$ ……….. (66.39 - 6.639 - 0.6639 - 6639)

d) 3 ……….. { 3, 6 , 9} ($\in$ - $\notin$ - $\subset$ - $\not\subset$)

e) The altitudes of the …………… –angled triangle intersect at one point outside the triangle. (right , acute , obtuse)

f) If a fair die is thrown once, then the probability of appearing a number smaller than 7 is ………… ($\frac{1}{3}$, 0 , 1 , $\frac{5}{6}$)

g) 57 days $\simeq$ ………… weeks (6, 2 , 8, 4)

2) Complete:

a) A metallic coin was thrown once, the probability of appearing a head is ……………

b) The set of all factors of the number 4 $\cap$ {1, 3 , 5} =…………………………

c) If {5,10} = {y-2 , 5} , then y=……………………

d) $2\frac{2}{5} \div 1\frac{1}{10} =$ …………

e) The number 639.8365 $\simeq$ 639.837 to the nearest …………..

f) The altitudes of the right –angled triangle intersect at ……………………..

3) a) Draw the equilateral triangle ABC whose side length = 4 cm, then draw $\overline{AD} \perp \overline{BC}$ then find the perimeter of Δ ABC.



b) Find the area of the rectangle if its dimensions are 3.5 cm , 6.5 cm then approximate the result to the nearest tenth.

---

4) a) Write all subsets of the set Y= { 1, 2 }

b) If the price of one meter of cloth is 6.25 pounds find the price of 2.5 meter?

---

5) a) If X={ 1 , 2 , 3 , 4 , 5} ∩ { 2 , 4 , 6}, Complete using (∈ - ∉ - ⊂ - ⊄):

- { 6 } ……… X
- 5 ……… X
- 2 ……… X
- { 2, 4} ……… X

b) A fair die was thrown once, the probability of appearing :

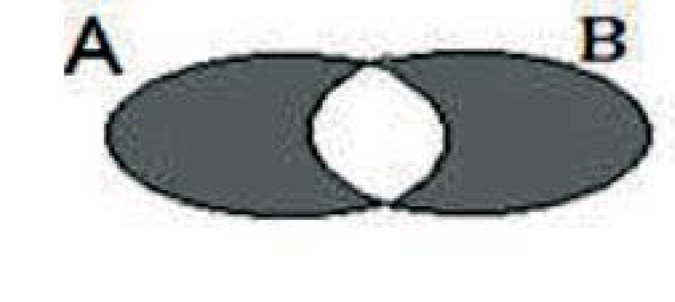
- An odd number
- A number greater than 5.
- An even prime number.
- A number divisible by 3.

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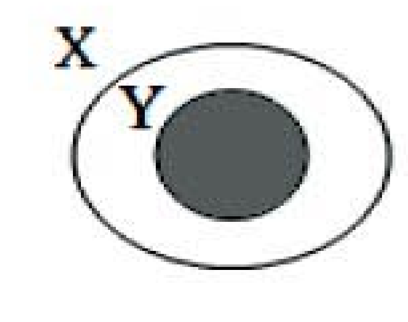
6)a) In the opposite figure:

Three circles of centers M, N and O of radius length 5 cm for each, Find the perimeter of the triangle MNO.

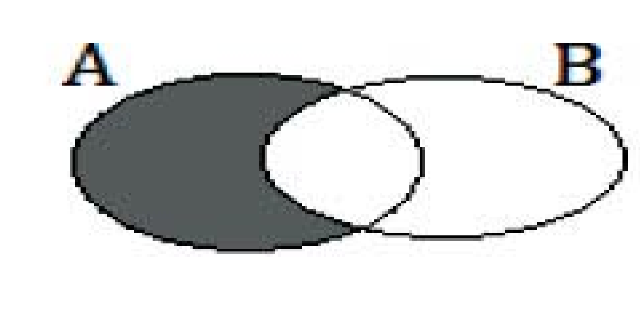
b) Write what is represented by shaded part in each diagram.



……….



……….



……….